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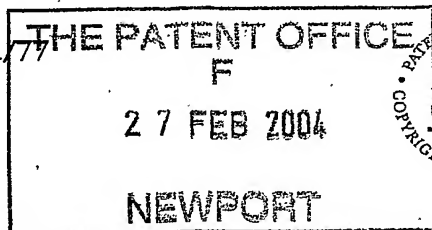
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1/77

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1. Your reference

P36563-/NGR/GMU

2. Patent application number

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0404356.8

20FEB04 0876722.1 0404356.8

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3. Full name, address and postcode of the or of each applicant (underline all surnames)

Rocep Lusol Holdings Limited
Rocep Business Park
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Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

United Kingdom

6837694202

4. Title of the invention

"Apparatus for Controlling Flow Rate from a Tilttable Valve Dispenser"

5. Name of your agent (if you have one)

Murgitroyd & Company

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

165-169 Scotland Street
Glasgow
G5 8PL

Patents ADP number (if you know it)

1198015

6. Priority: Complete this section if you are declaring priority from one or more earlier patent applications, filed in the last 12 months.

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(day / month / year)

United Kingdom

7. Divisionals, etc: Complete this section only if this application is a divisional application or resulted from an entitlement dispute (see note f)

Number of earlier UK application

Date of filing
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Yes

Answer YES if:

- a) any applicant named in part 3 is not an inventor, or
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Continuation sheets of this form

Description	12
Claim(s)	-
Abstract	-
Drawing(s)	2 + 2 SW

10. If you are also filing any of the following, state how many against each item.

Priority documents	-
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Statement of inventorship and right to grant of a patent (Patents Form 7/77)	-
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11. I/We request the grant of a patent on the basis of this application.

Signature(s)

Murgitroyd & Co.

Date 26 Feb 2004

12. Name, daytime telephone number and e-mail address, if any, of person to contact in the United Kingdom

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1 APPARATUS FOR CONTROLLING FLOW RATE FROM A TILTABLE
2 VALVE DISPENSER

3
4 This invention relates to dispensing apparatus and
5 to a user operated valve assembly for use with a
6 dispensing apparatus. Particularly, but not
7 exclusively it relates to a dispensing apparatus and
8 valve assembly for dispensing viscous materials from
9 a container under pressure of a propellant.

10
11 It is known to provide a dispensing apparatus which
12 includes a tilt valve mechanism fitted to a
13 container filled with a product, for example mastic
14 or sealant, which is to be dispensed. The user
15 pushes the valve stem to one side to open the valve
16 and dispense product from the pressurised container.
17 However such dispensers are intended for use only in
18 situations where a full flow of product is required.
19 There is no intermediate setting of the valve which
20 permits an intermediate flow rate, and it can be
21 difficult to ensure a steady stream of flow unless
22 the valve is fully open.

1 It is an object of the present invention to provide
2 a dispensing apparatus which overcomes one or more
3 of the above disadvantages.

4
5 According to a first aspect of the present invention
6 there is provided a valve assembly for use with a
7 dispensing apparatus, the valve assembly comprising:
8 a tilt valve including a valve stem;
9 a lever coupled to the valve stem;
10 variable spacer means arranged to limit the
11 travel of the lever by a variable amount according
12 to the relative position of the lever and the
13 variable spacer means.

14
15 Preferably the variable spacer means is adapted to
16 prevent travel of the lever in a particular relative
17 position of the lever and the variable spacer means.
18 In this position the lever cannot be operated so
19 that the valve is effectively locked in a closed
20 position.

21
22 Preferably the valve assembly includes a nozzle.
23 Preferably the lever is integral with the nozzle.
24 Preferably the nozzle is sealingly engaged with the
25 valve stem.

26
27 Preferably the variable spacer means includes a
28 plurality of spacer portions of differing thickness,
29 each spacer portion being arranged to limit the
30 travel of the lever by a predetermined amount. One
31 spacer portion may be arranged to allow a full range
32 of travel of the lever so that by pressing the lever

1 fully the valve is fully opened. Another spacer
2 portion may be arranged to allow a partial range of
3 travel of the lever so that by pressing the lever
4 fully the valve is opened to an intermediate flow
5 setting. Further spacer portions may be arranged to
6 provide further intermediate flow settings.

7
8 Alternatively the variable spacer means may comprise
9 a cam surface arranged to limit the travel of the
10 lever by an amount which varies with the relative
11 position of the lever and the variable spacer means.
12 This allows the user of the valve assembly infinite
13 adjustment of the flow rate by selecting a
14 particular relative position of the lever and the
15 variable spacer means.

16
17 In a first preferred embodiment the variable spacer
18 means comprises a collar which in use engages with a
19 container with which the valve assembly is used.

20
21 Preferably the spacer portions comprise a plurality
22 of portions of the collar of different height
23 adapted to contact the lever when the lever is at
24 the limit of its travel. Preferably the lever is
25 rotatably mounted relative to the valve so that in
26 use the lever is rotated to select a required limit
27 of travel of the lever and hence a required flow
28 setting of the valve. The collar may be provided
29 with markings to indicate the flow setting
30 associated with each portion of the collar.

31

1 Preferably the collar is adapted to press fit on the
2 rolled flange of a standard pressurised container.

3

4 In a second preferred embodiment the variable spacer
5 means comprises a collar rotatably mounted around
6 the valve stem beneath lever.

7

8 Preferably the spacer portions comprise a plurality
9 of portions of the collar of different thickness
10 adapted to space the lever from the container with
11 which the valve assembly is used when the lever is
12 at the limit of its travel. Preferably the collar
13 is rotatably mounted relative to the valve so that
14 in use the collar is rotated to select a required
15 limit of travel of the lever and hence a required
16 flow setting of the valve. The collar may be
17 provided with markings to indicate the flow setting
18 associated with each portion of the collar.
19 Alternatively the lever could be rotated relative to
20 the valve and the collar fixed.

21

22 Preferably the collar is in the form of a clip
23 having a radial slot. In this way the collar can be
24 readily fixed to a valve stem with a lever already
25 in place.

26

27 Preferably the collar is mounted on a portion of the
28 nozzle which extends below the lever. This allows
29 the nozzle, lever and collar to be pre-assembled as
30 a nozzle assembly which can then be snap fitted onto
31 the valve stem of a tilt valve at any stage in the
32 manufacturing process.

1

2 Preferably the collar is arranged to engage the
3 rolled flange of a container with which the valve
4 assembly is used when the lever is at the limit of
5 its travel.

6

7 According to a second aspect of the present
8 invention there is provided a dispensing apparatus
9 comprising a container and a valve assembly
10 according to the first aspect.

11

12 Preferably the apparatus comprises means for urging
13 the product from the container. Preferably the
14 container is pressurised. The container may contain
15 a propellant. The container may contain a piston,
16 situated between the propellant and the valve.

17

18 Preferably the valve assembly comprises a mounting
19 cup adapted to secure the valve to the container.
20 Preferably the container is provided with a rolled
21 flange portion and the mounting cup is provided with
22 a corresponding flange portion adapted to engage
23 with the rolled flange portion of the container.

24

25 Specific embodiments of the invention will now be
26 described, by way of example only, with reference to
27 the accompanying drawings in which:

28

29 Fig. 1 shows a collar of a valve assembly
30 according to the invention;

31

1 Fig. 2 shows a section through a valve assembly
2 including the collar of Fig. 1 with the lever in a
3 primed position and the valve closed;

4

5 Fig. 3 shows a section through the valve
6 assembly of Fig. 2 with the collar in an
7 intermediate flow position and the lever at the
8 limit of its travel with the valve opened to an
9 intermediate flow setting;

10

11 Fig. 4 shows a section through the valve
12 assembly of Fig. 2 with the collar in a full flow
13 position and the lever at the limit of its travel
14 with the valve fully open;

15

16 Fig. 5 shows a section through another valve
17 assembly according to the invention before
18 attachment of the collar with the lever in a primed
19 position and the valve closed;

20

21 Fig. 6 shows a section through the valve
22 assembly of Fig. 5 with the collar attached in an
23 intermediate flow position and the lever at the
24 limit of its travel with the valve opened to an
25 intermediate flow setting;

26

27 Fig. 7 shows a section through the valve
28 assembly of Fig. 5 with the collar attached in a
29 full flow position and the lever at the limit of its
30 travel with the valve fully open.

31

1 Referring to Figs. 1 to 4 of the accompanying
2 drawings, there is disclosed a valve assembly 10
3 fitted on a container 12 to form a dispensing
4 apparatus 11. In this example, the container 12 is
5 an aluminium monoblock container of the sort widely
6 used in aerosol applications. It is envisaged that
7 the can 12 could be of tin plate, steel or any
8 conventional can construction having a standard one
9 inch (25 mm) hole in the top. The can may be
10 internally lacquered. However the valve assembly of
11 the present invention can be used with a container
12 12 of any material holding a pressurised product,
13 for example a container of plastic, glass or metal.
14

15 The valve assembly 10 includes a valve 14, a nozzle
16 assembly 16, a lever 18 and a collar 20 secured to
17 the container 12. The valve is a tilt valve of the
18 type widely used in pressurised dispensers and
19 operated by tilting the valve stem 30. The valve
20 stem 30 is a hollow plastic tube with apertures 32
21 in the tube wall at the lower end. The upper end 34
22 is open, while the lower end is closed by a plastic
23 sealing disc 36. A resilient grommet 38 of rubber
24 or synthetic material surrounds the lower portion of
25 the stem 30 and is held in place by the sealing disc
26 36 and a retaining collar 31 formed on the outside
27 of the stem 30.
28

29 The grommet 38 is sealed to a mounting cup 44 of
30 metal. The mounting cup has an outer flange 48
31 which is adapted to fit around a rolled flange 13
32 which extends around the opening of the container

1 12. When the stem 30 is tilted, the sealing disc 36
2 is pushed away from the grommet 38 on one side, and
3 material in the container 12 is free to pass between
4 the sealing disc 36 and grommet 38, through the
5 apertures 32, along the inner bore of the stem 30
6 and through the open end 34 of the stem. When the
7 stem is released, the resilience of the grommet 38
8 pushes the stem back to the position shown in Fig 2.

9
10 The nozzle assembly 16 includes a nozzle 22 at its
11 upper end. In the example the nozzle 22 is angled,
12 but it may be straight or positioned at a different
13 angle. In the example the lever 18 is integrally
14 formed with the nozzle assembly 16 as a one-piece
15 plastic moulding, but it may be attached separately.
16 The nozzle assembly sealingly engages at its lower
17 end with the valve stem. This can be by a screw
18 thread or snap fit or any other appropriate
19 engagement means. The nozzle 22 may be provided
20 with a removable nozzle cap (not shown).

21
22 The collar 20 is shown in more detail in Fig. 1.
23 The collar 20 is a ring shaped collar formed of
24 moulded plastic and includes a circular groove 50 in
25 its lower face which is adapted to snap fit over the
26 rolled flange 13 of the container and/or the outer
27 flange 48 of the mounting cup 44.

28
29 The collar 20 is a variable spacing means and has a
30 number of spacer portions 52, 54, 56, each of
31 different height, arranged about the collar. In use
32 the lever 18 is rotated until it extends over the

1 required spacer portion. The user then depresses
2 the lever until the underside 60 of the lever 18
3 contacts the top of the spacer portion, at which
4 point the lever 18 is at the limit of its travel.
5 By positioning the lever over a different spacer
6 portion 52, 54, 56 the user selects a different
7 limit of travel and therefore a different flow
8 setting of the valve. Fig 3 shows the lever 18
9 fully depressed over spacer portion 56, with the
10 valve 14 opened to an intermediate flow setting.
11 Fig 4 shows the lever 18 fully depressed over spacer
12 portion 52, with the valve 14 opened to a fully open
13 flow setting.

14
15 To dispense product, a user presses down on the
16 handle 62 of the lever, moving it from the primed
17 position shown in Fig 2 towards the body of the
18 container 12 to adopt the dispensing position shown
19 in Fig 3 or 4. Because there is a predetermined
20 valve position associated with each dispensing
21 position, product is urged to flow, by virtue of the
22 internal pressurisation of the pack, at a constant
23 predetermined rate through the ports 32 and up
24 through the valve stem 30 and out through the nozzle
25 22.

26
27 To stop dispensing, the user simply releases the
28 handle 62. This closes the valve by allowing the
29 valve stem 30 to tilt back to the position shown in
30 Fig 2 and close access through the ports 32.

31

1 The collar 20 may include a further spacer portion
2 (not shown) which is higher than the other spacer
3 portions 52, 54, 56 and which extends to the
4 underside 60 of the lever 18. The lever could then
5 be rotated to extend over the higher spacer portion
6 to prevent travel of the lever and effectively lock
7 the valve in a closed position. If required the
8 collar may include a corresponding projection
9 diametrically opposite to prevent the lever being
10 pivoted in the opposite direction when the lever is
11 in the "locked" position.

12
13 Figs 5 to 7 show a further embodiment of a valve
14 assembly 10' according to the invention. The
15 container 12, valve 14, nozzle assembly 16 and lever
16 18 are the same as those described above with
17 reference to Figs 2 to 4, and so are not described
18 further.

19
20 In this embodiment the variable spacer means is a
21 ring-shaped collar 80 with a radial slot (not shown)
22 adapted to clip around the shaft of the nozzle
23 assembly 16 beneath the lever 18. In the
24 illustrated embodiment of Figs 6 and 7 the collar
25 has two spacer portions 82, 84, although the number
26 of spacer portions can be varied. In use the lever
27 18 or collar 80 is rotated until the lever 18
28 extends over the required spacer portion 82, 84.
29 The user then depresses the lever until the lever 18
30 urges the spacer portion into contact with the
31 flange 13 of the container 12, at which point the
32 lever 18 is at the limit of its travel. By

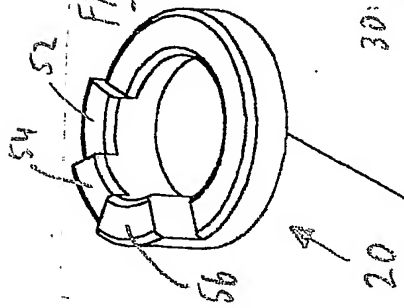
1 positioning the lever over a different spacer
2 portion 82, 84 the user selects a different limit of
3 travel and therefore a different flow setting of the
4 valve. Fig 6 shows the lever 18 fully depressed
5 over spacer portion 82, with the valve 14 opened to
6 an intermediate flow setting. Fig 7 shows the lever
7 18 fully depressed over spacer portion 84, with the
8 valve 14 opened to a fully open flow setting.

9
10 Operation is as described for the first embodiment.
11 The collar 80 may include a further spacer portion
12 (not shown) which is deeper than the other spacer
13 portions 82, 84 and which extends over height H as
14 shown in Fig 5 when the lever 18 is in the at-rest
15 position. The lever 18 or collar 80 could then be
16 rotated to prevent travel of the lever and
17 effectively lock the valve in a closed position. If
18 required the collar 80 may include a corresponding
19 projection diametrically opposite to prevent the
20 lever being pivoted in the opposite direction when
21 the lever is in the "locked" position.

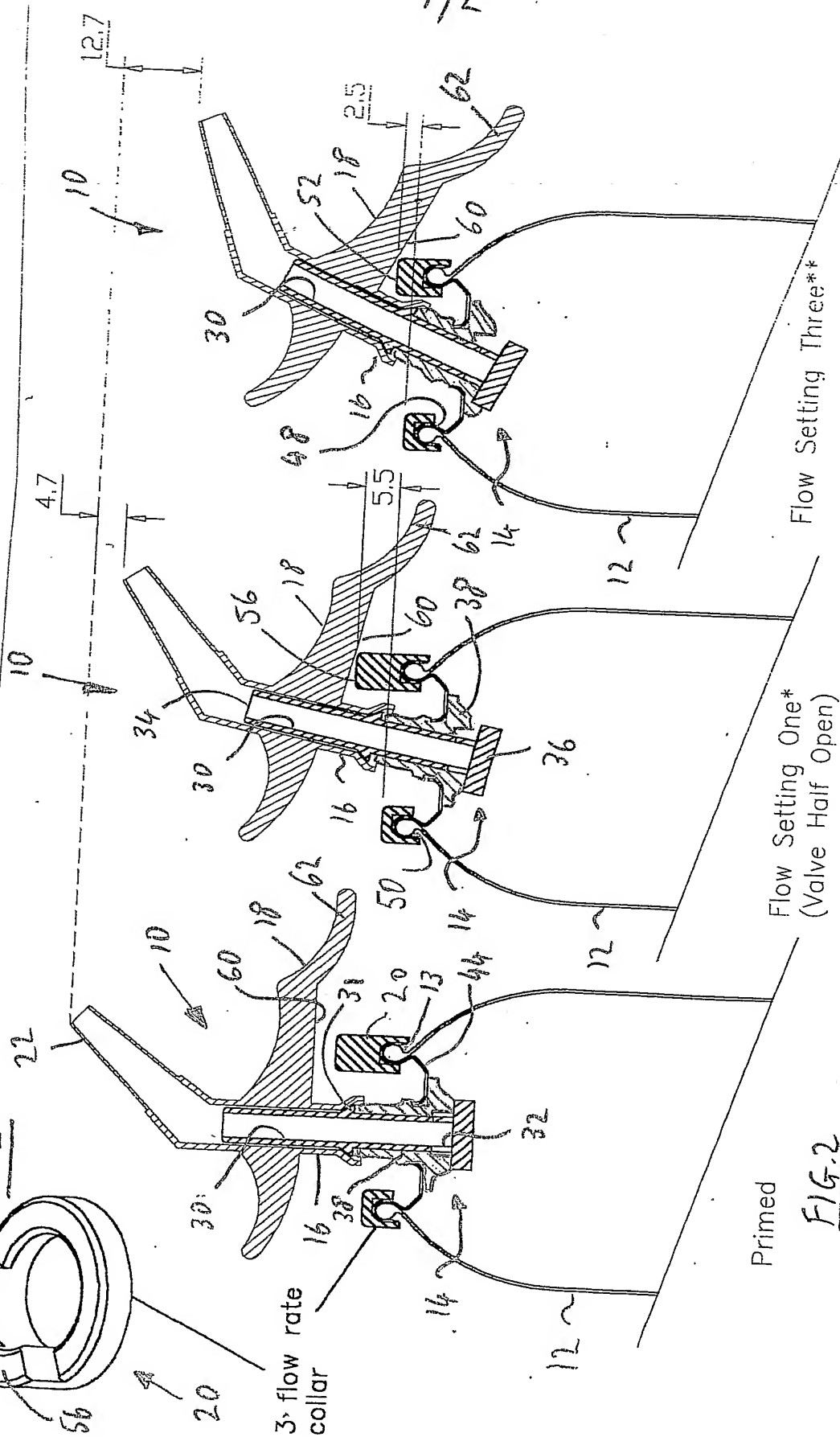
22
23 Modifications and improvements may be made to the
24 foregoing without departing from the scope of the
25 invention. In particular the step-like spacer
26 portions 52, 54, 56, 82, 84 of the illustrated
27 embodiments may be replaced by cam surfaces which
28 allow quasi-infinite adjustment of the maximum
29 travel of the lever. The variable spacer means 20,
30 80 may have shapes and forms other than those
31 illustrated. The shape and form of the lever 18 may
32 be varied. The collar 82, 84 may rotatably or

1 slidably fixed to the underside 80 of the lever.
2 The spacer portions may be adapted to bear on a part
3 of the container 12 or mounting cap 44 other than
4 the rolled flange 13. The spacer portions 52, 54,
5 56, 82, 84 may be provided with locating grooves or
6 other means to encourage engagement with the lever
7 18 at particular relative rotational positions.

FIG. 1



3. flow rate collar



Primed

FIG. 2

Flow Setting One*
(Valve Half Open)

FIG. 3

Flow Setting Three**

FIG. 4



